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Grimm et al.

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(54) **ROLLER BLIND SYSTEM FOR A MOTOR VEHICLE**

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B60J 7/00 (2006.01)
B60J 3/02 (2006.01)

(52) **U.S. Cl.** **296/214**; 296/219; 160/245; 160/273.1

(58) **Field of Classification Search** ..... 296/214, 296/219, 141 US, 142 US; 160/243, 245, 160/273.1
See application file for complete search history.

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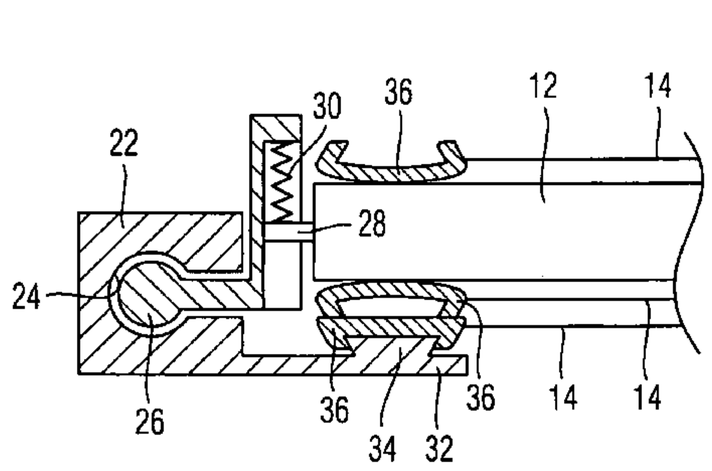
(57) **ABSTRACT**

A roller blind system for a vehicle roof includes a rotatable coiling body and a roller blind that is attached at one end to the coiling body and at the other end to a vehicle portion in a stationary manner. The coiling body is shiftable in a translational motion, allowing the roller blind to uncoil and coil up while minimizing frictional forces on the roller blind.

3 Claims, 3 Drawing Sheets



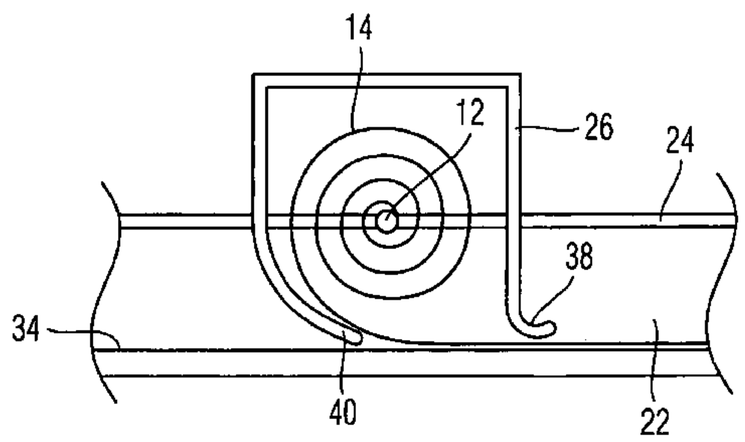


Fig. 1

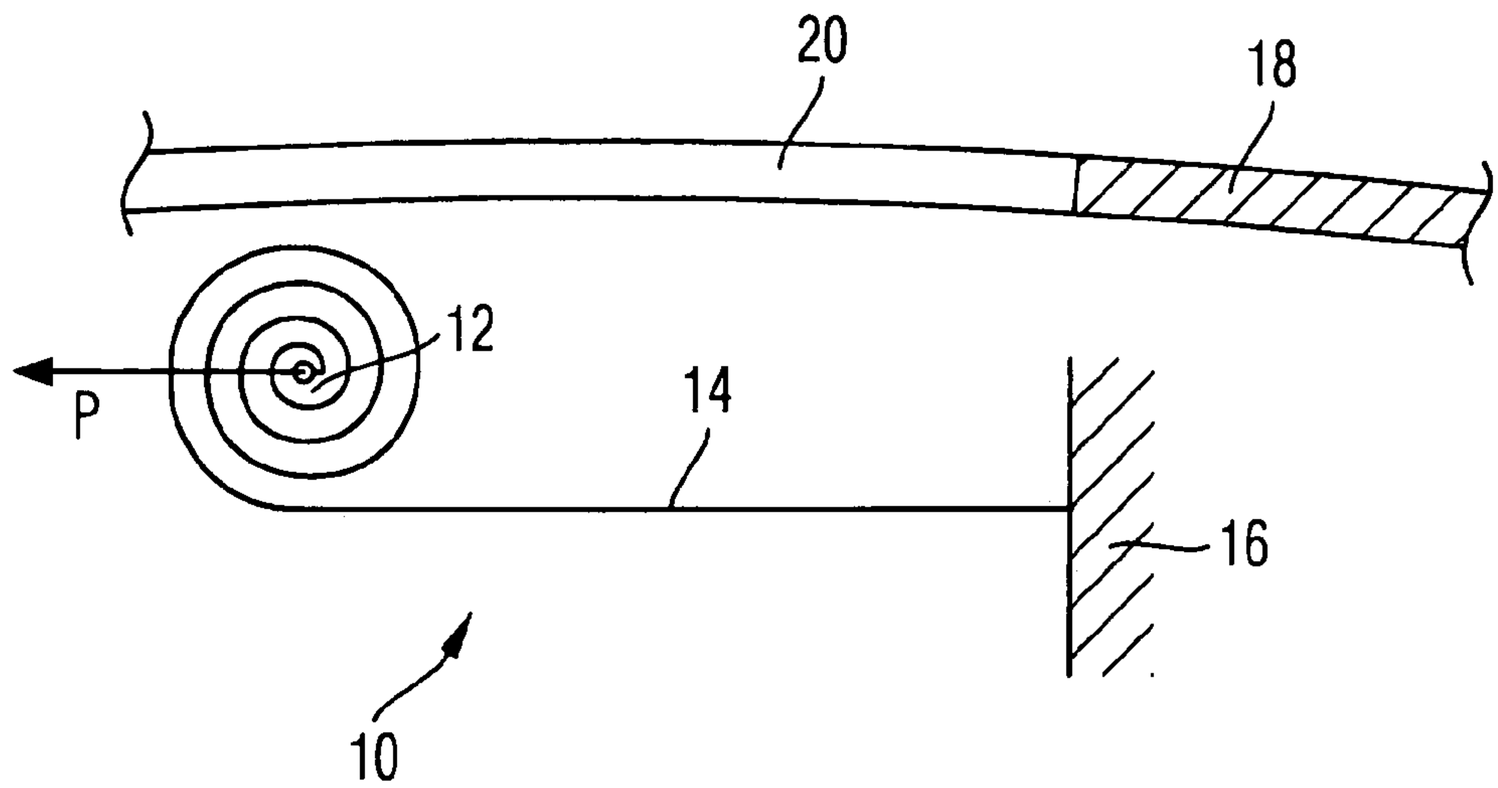


Fig. 2

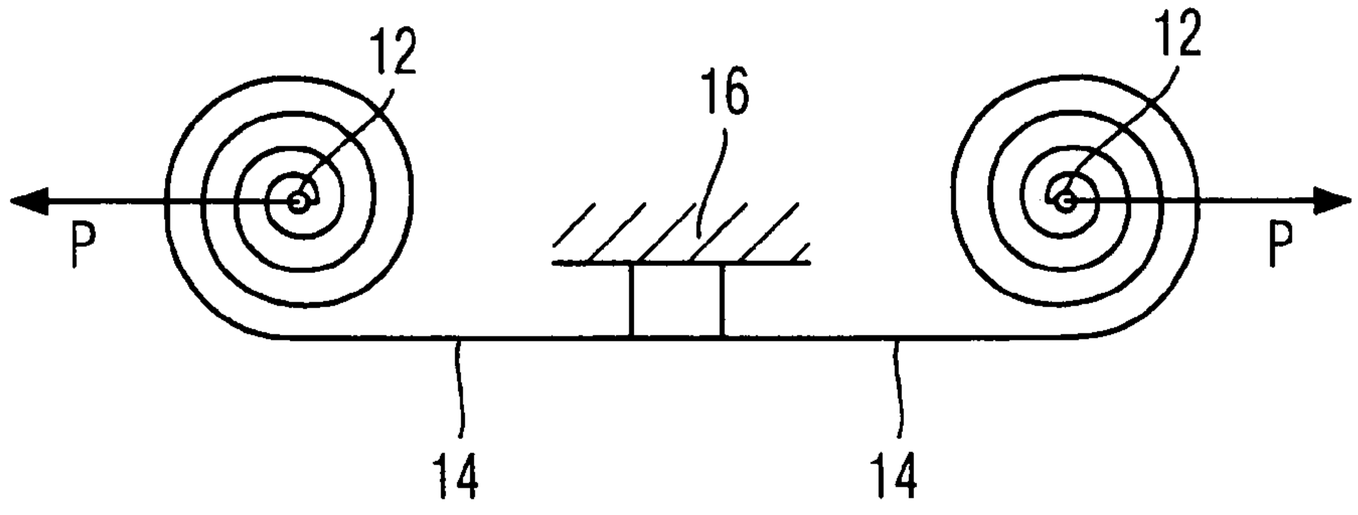


Fig. 3

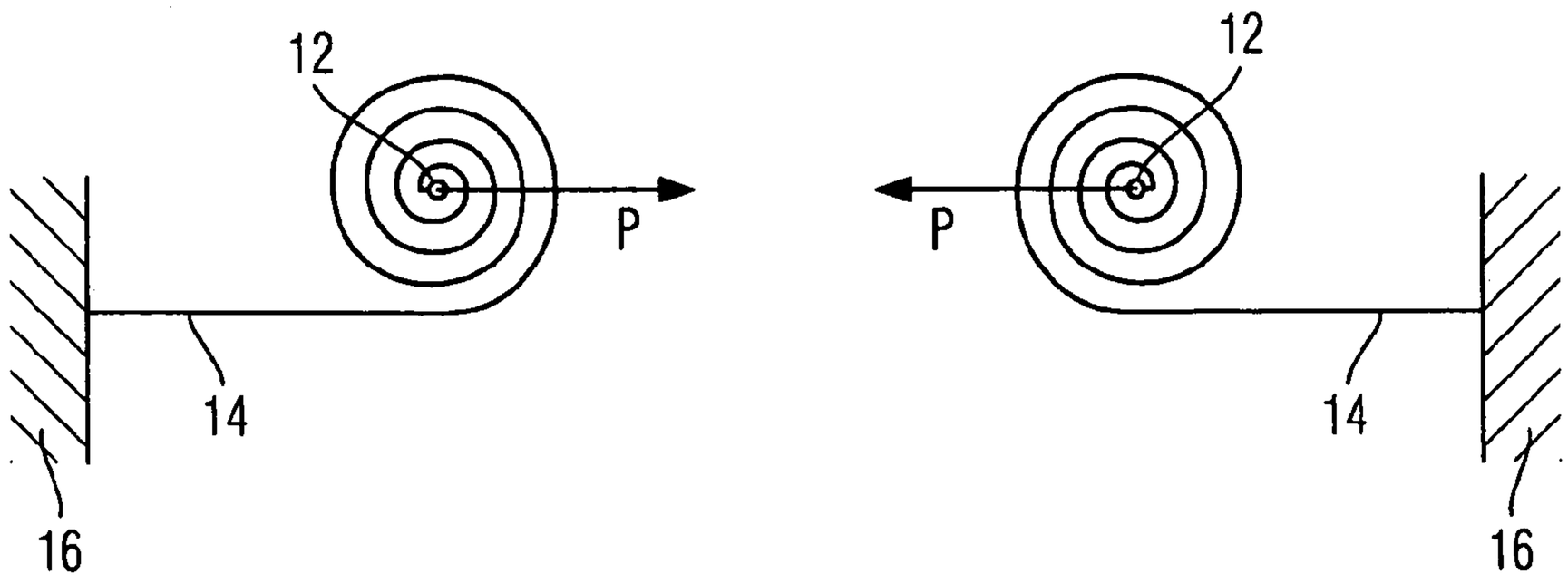
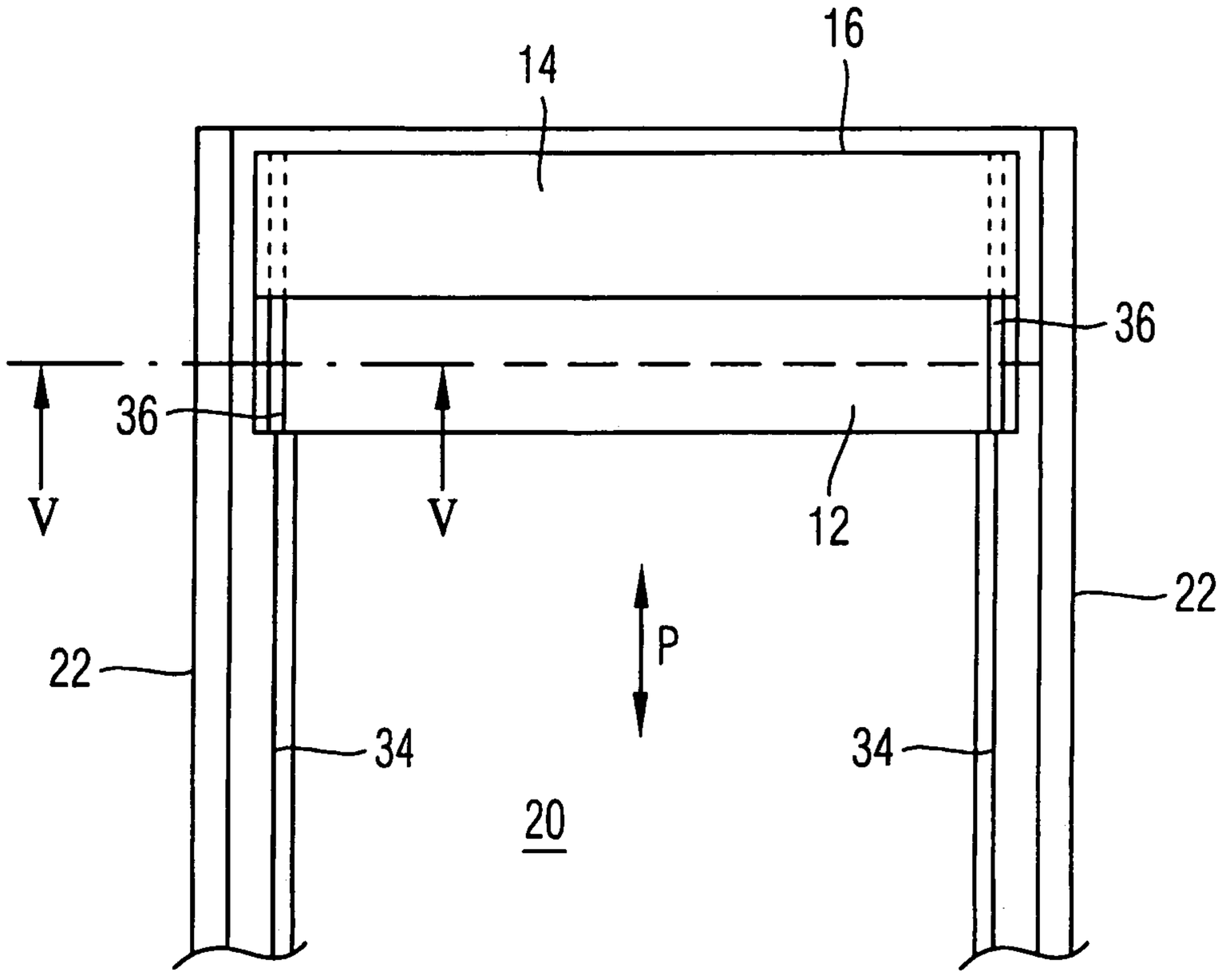


Fig. 4


16
14
36
36
V
V
12
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20

Fig. 5

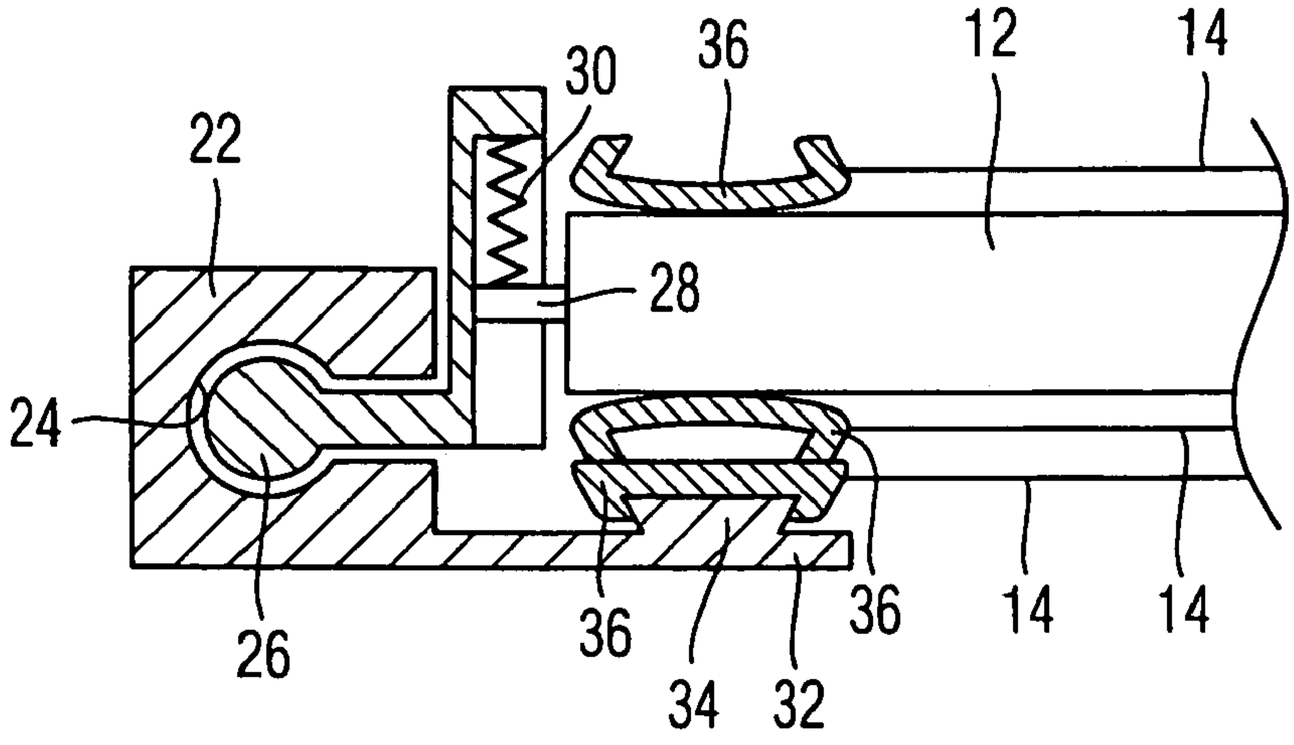
30
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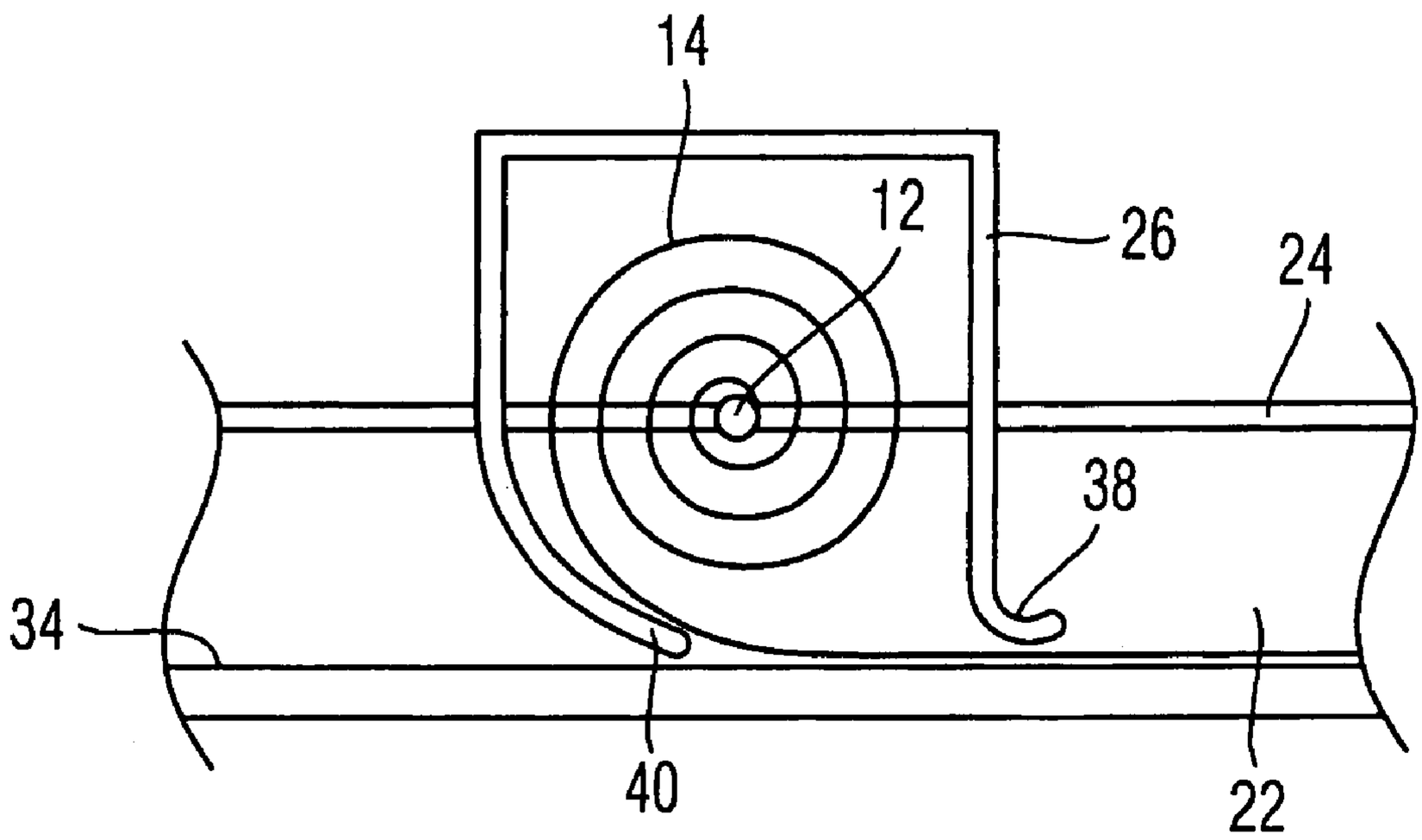
Fig. 6



ROLLER BLIND SYSTEM FOR A MOTOR VEHICLE

REFERENCE TO RELATED APPLICATIONS

The present invention claims the benefit of German Patent Application No. 102 56 599.6, filed Dec. 4, 2002.

TECHNICAL FIELD

The invention relates to a roller blind system, in particular for a motor vehicle, comprising a coiling body that is rotatable and a roller blind that is attached at one end to the coiling body.

BACKGROUND OF THE INVENTION

Various designs of roller blind systems for vehicles are known. German Published Patent Application 197 39 919, for example, discloses a roller blind system in which a coiling body is mounted at an edge of an opening in a vehicle roof. The roller blind may be withdrawn from the coiling body so that the roller blind extends across the area of the opening to constitute a sunshade in this area. The roller blind is laterally guided by a pair of guide rails into which the longitudinal edges of the roller blind are inserted when the blind is withdrawn from the coiling body.

The disadvantage of this structure is that the forces for actuating the roller blind rise super-proportionally when the blind is withdrawn from the coiling body. First, there is in fact an increase in a retracting force that is exerted on the coiling body by a retracting spring. Additionally, a frictional force is produced by friction between the edges of the roller blind and the guide rails and increases as the withdrawal length of the roller blind increases.

One object of the invention to further develop a roller blind of the type mentioned above that reduces the increase in the actuating forces as an increasing amount of the roller blind is withdrawn.

SUMMARY OF THE INVENTION

Accordingly, one embodiment of the invention is directed to a roller blind system having one end secured to a coiling body and its opposite end mounted to the vehicle so that it is stationary. The coiling body is adapted to be shifted by a translational motion. This roller blind system is based on the fundamental concept that the friction between the guide rails and the roller blind occurring in prior art systems can be avoided by having the coiling body perform a translational motion. As a result, the roller blind remains stationary and is uncoiled across the area which it is intended to cover. This uncoiling is conducted instead of withdrawing the roller blind from the coiling body, which would result in an even longer area of the roller blind needing to be shifted.

In accordance with one embodiment of the invention, the system may include two guide rails that releasably connect two longitudinal edges of the roller blind. This allows the guide rails to receive the roller blind firmly at its edges in a manner similar to that known in the prior art, with the roller blind in the roller blind system according to the invention being stationarily connected with the guide rail at a multitude of points when the coiling body is moved in relation to the guide rail. In a particularly simple embodiment, the guide rail and the associated longitudinal edge of the roller blind are provided with two mating parts of a VELCRO® fastener. This allows stationary attachment of the roller blind to the two guide rails when the coiling body is moved along the guide rails.

According to one embodiment of the invention, each longitudinal edge of the roller blind has a detent part that may be connected with a counterpart fitted to or integrated into the guide rail. The longitudinal edges of the roller blind are thus fitted to the guide rails with an interlocking fit when the coiling body moves along the guide rails.

The two guide rails may be configured so they are parallel to each other to accommodate a rectangular roller blind. It is further possible for the two guide rails to be disposed at a variable distance from each other and for the roller blind to have a variable width such that the two longitudinal edges of the roller blind follow the course of the guide rails. In this arrangement, the guide rails may extend in a straight line while being inclined with respect to each other or they each may be curved.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described with reference to different embodiments illustrated in the accompanying drawings in which:

FIG. **1** shows a schematic diagram of a roller blind system in accordance with a first embodiment of the invention;

FIG. **2** shows a schematic diagram of a roller blind system in accordance with a second embodiment of the invention;

FIG. **3** shows a schematic diagram of a roller blind system in accordance with a third embodiment of the invention;

FIG. **4** shows a diagrammatic top view of a roller blind system in accordance with the first embodiment;

FIG. **5** shows the section V—V of FIG. **4** on an enlarged scale; and

FIG. **6** shows a diagrammatic sectional view of a variant of a roller blind system in accordance with the first embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

FIG. **1** diagrammatically shows a roller blind system **10** having a coiling body **12** and a roller blind **14**. One end of the roller blind **14** is firmly secured to the coiling body **12** while the opposite end is mounted to the vehicle to be stationary. This stationary mounting surface is symbolized in FIG. **1** by a vehicle portion **16**. The roller blind system **10** is fitted below a roof **18** of a motor vehicle having a roof opening **20**. The roof opening **20** may be closed by a cover (not shown) of a sliding roof system.

The coiling body **12** is usually accommodated within a cartridge (not shown) and may be shifted below the roof opening **20** by a translational motion. When the coiling body **12** is shifted to the left in the direction of the arrow P shown in FIG. **1**, the roller blind **14** extends beneath the roof opening **20** to form a sunshade.

FIG. **2** shows a roller blind system having two coiling bodies **12**. One roller blind **14** is received on each coiling body **12**, and the two roller blinds **14** are connected to each other. In this example, the two roller blinds **14** are fixedly secured to the vehicle portion **16** at the juncture between the two blinds **14**. The two coiling bodies **12** may be shifted in opposite directions to each other so that, for instance, a front roof opening and a rear roof opening of a vehicle roof may be respectively covered by the two roller blinds.

FIG. **3** shows a roller blind system which, similar to the roller blind system shown in FIG. **2**, comprises two roller

blinds **14** that are received on two coiling bodies **12**. Unlike the roller blind system of FIG. **2**, the roller blind system of FIG. **3** does not connect the two roller blinds with each other. Instead, the two roller blinds **14** are respectively connected to two opposing vehicle portions **16**. The two opposing coiling bodies **12** may be brought together toward the center so that, for instance, a front and a rear roof opening may be respectively covered by the two roller blinds.

FIGS. **4** and **5** show a roller blind system corresponding to the structure illustrated in FIG. **1**. Like reference numerals are used for like components described with respect to FIG. **1**, and in this respect reference is made to the foregoing discussions.

The roller blind system includes two guide rails **22** that extend along the longitudinal edges of the roof opening **20**. At the top end in FIG. **4**, the two guide rails **22** are connected by a crosspiece, which corresponds to the stationary vehicle portion **16** described above, where one end of the roller blind **14** is fastened.

Each guide rail **22** has a guide groove **24** (FIG. **5**) in which a sliding carriage **26** is guided. An arbor **28** of the coiling body **12** is received in the sliding carriage **26**. A pretensioning spring **30** connected to the arbor **28** urges the coiling body **12** toward a base section **32** of the guide rail **22**. The base section **32** has a counterpart, such as a detent web **34**, formed thereon and having a dovetailed cross-section.

The roller blind **14** is received on the coiling body **12**, with two thicknesses thereof being shown in this arrangement. Each longitudinal edge of the roller blind **14** is provided with a clip **36** (FIG. **5**), which may be made of plastic and has an inside cross-section shaped to be complementary to the dovetailed cross-section of the detent web **34**. The roller blind **14** may be molded into the clip **36**, for example. The material of the clip **36** is flexible so that the roller blind, along with the two clips, may be received at its longitudinal edges on the coiling body **12**.

When the coiling body is shifted downward in regard to FIG. **4** and along the guide rails **22**, the roller blind **14** is uncoiled from the coiling body **12** which, assisted by the pretensioning spring **30**, presses the clip **36** onto the detent web **34** so that the clip **36** is gradually locked into place on the detent web **34** with an interlocking fit. This results in reliable lateral guidance of the roller blind **14** in the area between the coiling body **12** and the vehicle portion **16**.

Note that any other suitable detent mechanism may be used instead of the interlocking clip **36** and detent web **34**. The detent mechanism may be any mechanism made up of a detent part and a counterpart adapted to be releasably connected with each other when the coiling body is moved along the two guide rails **22** without departing from the scope of the invention.

FIG. **6** illustrates another embodiment that differs from the embodiment shown in FIGS. **4** and **5** with respect to the way the roller blind **14** is connected with, and released again from, the guide rail.

In this embodiment, the coiling body **12** is mounted on the sliding carriage **26** to be non-displaceable. In this embodiment, the sliding carriage **26** is a cartridge having the roller blind **14** received therein and includes a pressure slider **38** that is elastically pretensioned so that it rests on the detent web **34** with a certain degree of pretension. The roller blind **14** or the clip **36** in this embodiment may be located between the pressure slider **38** and the detent web **34**. The sliding carriage **26** further includes a release slider **40** arranged between the roller blind **14** or the clip **36** fitted thereto and the detent web **34**. The roller blind **14** accordingly exits the cartridge between the pressure slider **38** and the release slider **40**.

When the sliding carriage **26** is shifted such that the roller blind **14** is withdrawn from the sliding cartridge **26**, the pressure slider **38** presses the clip **36** onto the detent web **34** so that it is locked in place. When the sliding carriage **26** is shifted in the opposite direction so that the roller blind **14** is received on the coiling body **12**, the release slider **40** will move between the clip **36** and the detent web **34** so that the roller blind **14** is released from the guide rail **22** to be coiled up.

It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that the method and apparatus within the scope of these claims and their equivalents be covered thereby.

What is claimed is:

1. A roller blind system for a motor vehicle, comprising:
a rotatable coiling body that is shiftable by a translational motion;
a roller blind attached at a first end to the rotatable coiling body and fixedly mounted at a second end to a vehicle portion;
two guide rails that guide two longitudinal edges of the roller blind wherein the two longitudinal edges are releasably connected to the two guide rails; and
a cartridge that receives the roller blind, the cartridge having a pressure slider that locks the roller blind with the two guide rails and a release slider that releases the roller blind from the two guide rails.

2. A vehicle roof assembly, comprising:
a vehicle roof having a roof opening;
a rotatable coiling body that is shiftable by a translational motion in a vicinity of the roof opening;
a roller blind attached at a first end to the rotatable coiling body and fixedly mounted at a second end to a vehicle portion, wherein the roller blind is moveable to open and close the roof opening;
two guide rails that guide the rotatable coiling body and two longitudinal edges of the roller blind;
a detent part disposed on each longitudinal edge of the roller blind;
a counterpart that is complementary to each detent part and fitted to each of the two guide rails such that the detent parts connect with the counterparts when the rotatable coiling body is shifted; and
a pretensioning mechanism that urges the rotatable coiling body against the counterparts.

3. A vehicle roof assembly, comprising:
a vehicle roof having a roof opening;
a rotatable coiling body that is shiftable by a translational motion in a vicinity of the roof opening;
a roller blind attached at a first end to the rotatable coiling body and fixedly mounted at a second end to a vehicle portion, wherein the roller blind is moveable to open and close the roof opening;
two guide rails that guide the rotatable coiling body and two longitudinal edges of the roller blind; and
a cartridge that receives the roller blind, the cartridge having a pressure slider that locks the roller blind with the two guide rails and a release slider that releases the roller blind from the two guide rails.

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